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Corn Diseases: An Aid to Identification and Control

Purdue University Cooperative Extension Service

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Department of Botany and Plant Pathology

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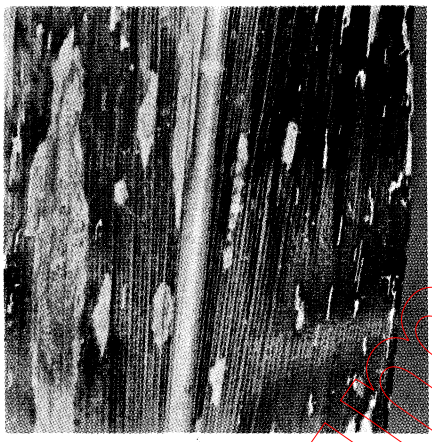
CORN DISEASES

An Aid to Identification and Control

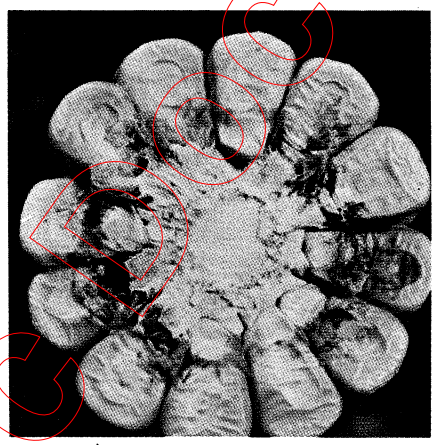
1. BROWN SPOT



2. HELMINTHOSPORIUM LEAF SPOT

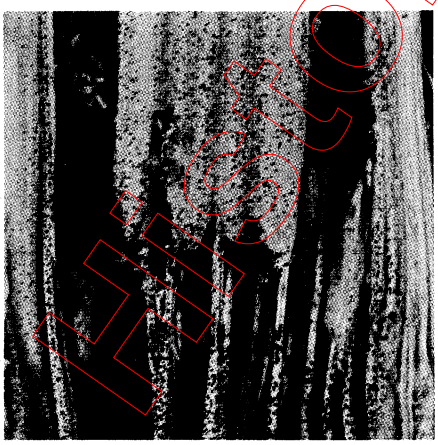
3. VIRUS DISEASE

4. SMUT



5. EAR ROT

6. NEMATODE DAMAGE TO ROOTS



7. CHARCOAL STALK ROT

8. STALK ROT AND LODGING

9. FUSARIUM STALK ROT

PREPARED BY THE CLEMSON UNIVERSITY COOPERATIVE EXTENSION SERVICE'S ENTOMOLOGY - PLANT PATHOLOGY AND AGRICULTURAL COMMUNICATIONS SECTIONS, FEDERAL EXTENSION SERVICE COOPERATING

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CORN DISEASES

An Aid to Identification

1. BROWN SPOT, caused by *Physoderma maydis,* is a common but relatively minor disease. It first appears as oblong to round water-soaked or light green lesions that later turn reddish brown. These spots coalesce to form brown blotches, especially at the base of leaf blades and adjacent leaf sheaths.

2. HELMINTHOSPORIUM LEAF SPOT. Two Helminthosporium leaf spot diseases occur in Indiana; Northern corn leaf blight, caused by *Helminthosporium turcicum,* and Southern corn leaf blight, caused by *H. maydis.* A third Helminthosporium leaf spot disease, caused by *H. carbonum,* occurs only on a few susceptible inbred lines. Northern corn leaf blight produces long, eliptical, grayish-green or tan lesions on leaves. These lesions appear first on the lower leaves and progress upward as the season advances. Severely affected plants appear dead and gray as though injured by frost or fired from inadequate fertility. Southern corn leaf blight is distinguished from Northern corn leaf blight in that the lesions are grayish-tan ranging from minute spots to 1½ inches long with parallel sides. Southern corn leaf blight occurs at slightly higher temperatures than Northern corn leaf blight and consequently is not found as far north as the latter.

3. VIRUS DISEASES. Several virus diseases affect corn; however, maize dwarf mosaic (MDM) is the only economically important virus disease in Indiana at this time. MDM is found primarily in the river bottoms and in close association with Johnsongrass. MDM causes a shortening of the upper internodes that imparts a feather-duster appearance to the plant. A faint mottle or mosaic of light and dark green islands may appear in the young leaves. As plants mature, the mosaic disappears and the leaves become yellowish-green and occasionally show blotches or streaks of red. Severely infected plants are barren or have poor seed set. This disease can be diagnosed positively only by transmission of the causal virus from infected to healthy plants in the greenhouse.

4. SMUT, caused by the fungus *Ustilago maydis,* commonly occurs in Indiana. While this disease occurs frequently, grain losses are usually minor. Large galls on and above the ear are more destructive than galls formed below the ear. All above ground parts of the plant are susceptible. Galls are first covered with a glistening white membrane that later becomes dry and cracks open, exposing the large masses of black, powdery spores contained therein. Galls on leaves seldom develop beyond the size of a pea and are usually associated with the veins of the leaf.

5. EAR ROTS. The five main rots in Indiana are Diplodia, Fusarium kernel rot, Nigrospora, Gibberella, and Gray ear rot. Diplodia ear rot, caused by the fungus *Diplodia maydis,* is the most common. The husks of ears infected early in the season appear bleached, stick tightly together and are usually covered with a white mold growth. Ears affected later in the growing season may show no external signs of disease until the ear is husked when a white mold will be found growing between the kernels beginning at the base of the ear and progressing toward the tip. Gibberella ear rot, caused by the fungus *Gibberella zeae,* is found more frequently in the northern part of the state. Corn infected with this disease is toxic to hogs. Gibberella ear rot is distinguished by the reddish to white mold growth that starts at the tip of the ear and progresses toward the base. Ears infected early may be completely rotted with the husks adhering tightly and a pinkish mold growth appearing between them. Fusarium kernel rot, caused by the fungus *Fusarium moliforme,* is distinguished by a pink or whitish discoloration of the caps of individual kernels or groups of kernels scattered over the ear. Infection often becomes established around points where corn earworms or other injuries have occurred. Nigrospora ear rot, caused by the fungus *Nigrospora oryzae,* produces light weight ears with slightly bleached, poorly finished kernels that are easily pressed into the cob. Shanks and bases of severely infected ears are easily shredded. Close examination of infected ears shows very small, black spore masses scattered in the cob pith and on the tips of kernels. Gray ear rot, caused by the fungus *Physalospora zeae,* is a minor disease occurring only when wet weather extends for several weeks after silking. The symptoms of this disease are somewhat similar to Diplodia ear rot, except in advanced stages the diseased ear becomes slate gray, and numerous black sclerotial bodies are found in the tip of the cob under the seed coat.

6. NEMATODE DAMAGE TO ROOTS. Plants with root systems damaged by nematodes generally appear stunted and unthrifty. Since many factors may produce similar symptoms, suspected nematode injury must be diagnosed by a competent nematologist. To date, nematode damage to corn is a minor problem in Indiana.

7-9. STALK ROTS OF CORN. Stalk rots are among the most serious diseases affecting corn in Indiana. Yearly losses average 7-14% over the state. Stalk rots cause premature death of plants. The greatest damage is caused by lodging (Figure 8), which makes harvesting difficult. Three stalk rots occur in Indiana: Diplodia, Gibberella and Charcoal rot. With all three stalk rots, the pith tissues become disintegrated and the stalk internodes are easily crushed between the fingers. Charcoal rot is easily identified when affected stalks are split open. Small, black specks, or sclerotia, of the fungus are scattered over the surface of the vascular bundles (Figure 7). When stalks affected with Gibberella stalk rot are split, they will generally show a reddish discoloration of the diseased area (Figure 9). Figure 9 is labelled as Fusarium stalk rot; however, in Indiana, the disease is known as Gibberella stalk rot, caused by the fungus *Gibberella zeae.* Diplodia stalk rot (not pictured) will appear similar to Gibberella stalk rot but will lack the reddish discoloration.

Prepared by Donald H. Scott and Eric G. Sharvelle, plant pathologists.

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